GRAND CANYON GUIDE no. 2

... illustrations from Grand Canyon Explorer … Bob Ribokas : http://www.bobspixels.com/kaibab.org/

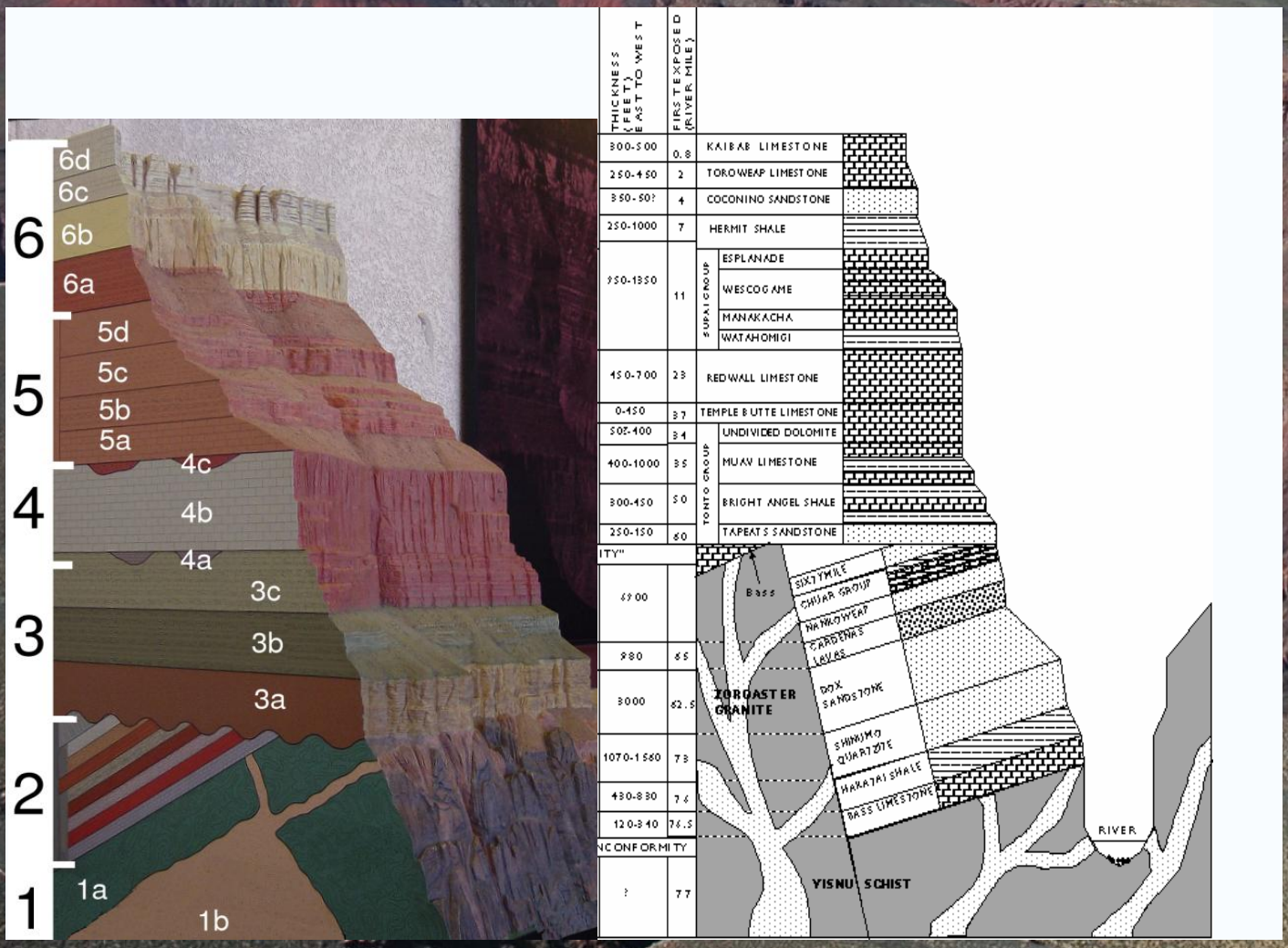
AN AMATEUR'S REVIEW OF BACKPACKING TOPICS

FOR THE

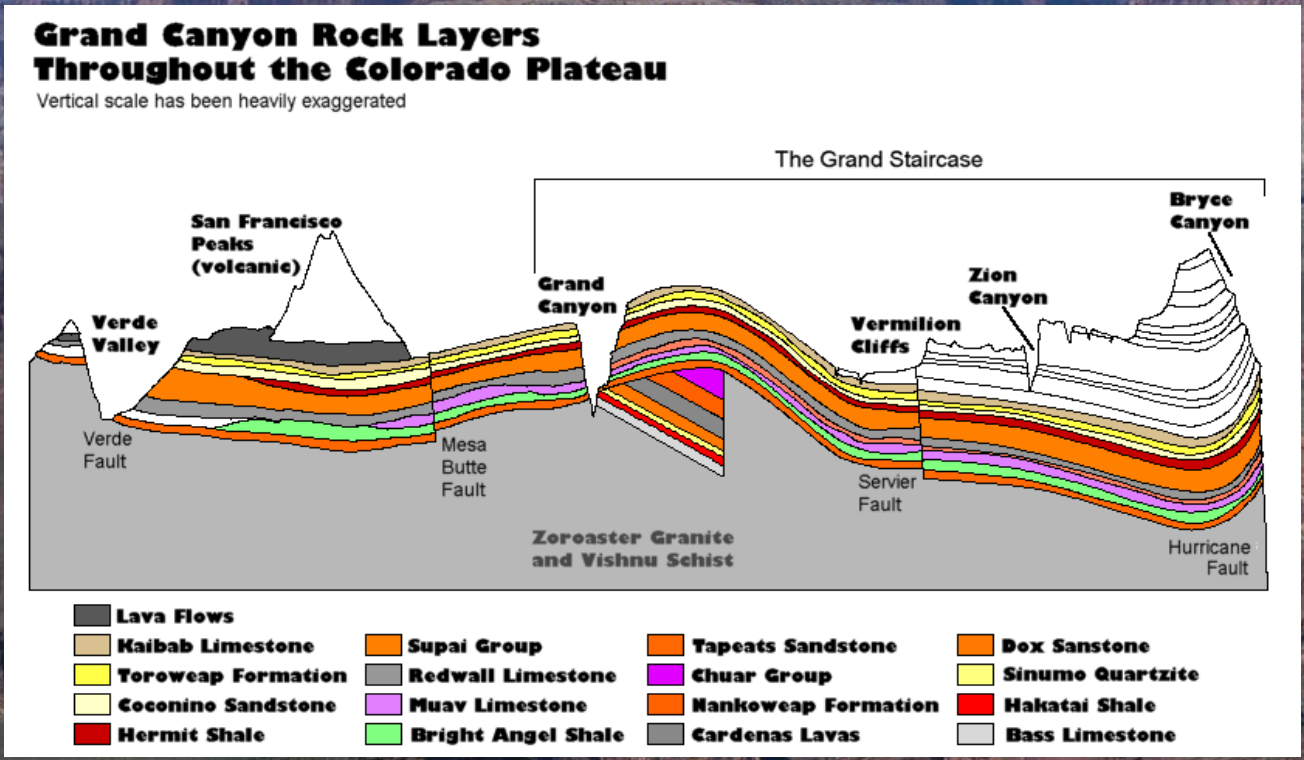
T254 - EXPEDITION TO THE GRAND CANYON - MARCH 2007

GEOLOGY OF THE CANYON

Viewing the Grand Canyon from the rim, one is immediately awed by the enormous empty volume of what is not there. Where is all of the solid earth that had apparently once been in the space in front of you, but now is gone? The simple answer, of course, is: swept away, crumbled, and washed downstream in the tributaries and main channel of the Colorado River.



As you descend along trails that drop from the Kaibab Plateau, however, you quickly become absorbed by the ever-changing colors and consistencies of the rock grinding under your boots and forming a wall just to one side. The problem here becomes trying to understand not the erosion and removal of stone, but rather its emplacement. How have the thick layers of sedimentary material come to lay here, one on top of the other in the first place, so that a canyon could begin to be cut? And what of that dark and beautiful gorge of metamorphic and igneous rock that rises 1000 feet from the water's edge all along the river?



Close observation of the rocks, even at the top of the canyon - now 7,200 ft above sea level - reveals shell fragments, pieces of coral, and other components of limestone. In other layers, grains of sand in sandstone identify them as having settled together as eroded mountain sediment deposited by rivers along the changing shorelines of vast oceans. Less frequently, a rock layer may show the marks of windswept cross-bedding typical of sand piled up as dunes in a seashore or desert environment. And then, abruptly, the layer cake ends in the depths of the canyon, horizontal layers resting on the darker, rounded shoulders of metamorphic schist and pink ribbons of igneous granite, whose crystals formed as rising molten magma turned solid miles below the surface.

Keep your eyes open as you walk the trails of the Grand Canyon. Move through the empty space that once was rock and look for the details exposed in this slice into the earth's crust.